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10/607,510	06/26/2003	John Roberts	WEAT/0393	4809

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WILLIAM B. PATTERSON  
MOSER, PATTERSON & SHERIDAN, L.L.P.  
Suite 1500  
3040 Post Oak Blvd.  
Houston, TX 77056

EXAMINER

BOMAR, THOMAS S

ART UNIT PAPER NUMBER

3672

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/607,510

Applicant(s)

ROBERTS, JOHN

Examiner

Shane Bomar

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,5,7-10,16,17,21-26,28,29,31-33,35-38 and 41-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24,26,28,29,32,33 and 41 is/are allowed.
- 6) ☒ Claim(s) 1,5,7-10,16,17,21,25,31,35-38,42 and 43 is/are rejected.
- 7) ☒ Claim(s) 22 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/12/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 5, 7-10, 38, and 43 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Paragraphs [0018] and [0027] of the current specification state that the controller may vary the frequency, amplitude, *or* resonance of the sonic waves (emphasis added). One can even glean from paragraph [0027] that the frequency *and/or* the resonance may be varied by the controller (emphasis added). However, it is never stated that the frequency *and* the amplitude of the sonic waves may be varied at the same time by the controller. The last line of paragraph [0027] also states that the amplitude *may also be* varied by the controller (emphasis added), which does not convey the fact that the amplitude could be varied in addition to, or with, the varying of the frequency and the resonance previously mentioned. Therefore, this is considered new matter.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 25, 31, and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodine in view of Flanders et al as originally applied to claim 1, and further in view of US patent 5,037,524 to Juvan.

Regarding claim 1, Bodine teaches a back-off tool for use in the tubular member disposed inside a wellbore that comprises a housing 103 and at least one sonic wave generator 102 mounted within the housing (see Figs. 2-3, col. 7, lines 33-37 and col. 8, lines 50-56), and a controller coupled to the sonic wave generator, the controller is configured to vary at least one of amplitude, frequency, and resonance of the sonic wave (see col. 16, lines 17-66, especially lines 53-61, and claims 3-4). It is not, however, taught that the sonic wave generator comprises a piezoelectric device as is currently claimed.

Flanders et al teach a sonic wave generator for use in the tubular member disposed inside a wellbore that comprises a housing similar to that of Bodine (see Fig. 1 and Summary of the Invention in columns 2-3). It is further taught that the sonic wave generator comprises a piezoelectric device (see col. 8, lines 46-48). It would have been obvious to one of ordinary skill in the art, having the teachings of Bodine and Flanders et al before him at the time the invention was made, to replace the sonic wave generator taught by Bodine with the piezoelectric device of Flanders et al, in order to obtain a device that can generate sufficient energy to vibrate the tubular member. One would have been motivated to make such a combination since Flanders et al have shown that piezoelectric devices are suitable equivalents of an electromechanical device (see col. 8, lines 36-48 of Flanders et al), wherein the device of Bodine is electromechanical (see col. 6,

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lines 51-66 of Bodine). A further motivation for combining these references is the fact that Bodine teaches another application for the device is to remove stuck pipe in a wellbore (see col. 2, lines 13-19 of Bodine), which is an important application of the Flanders et al device (see col. 3, lines 12-15 of Flanders et al).

However, this combination does not teach that this device is one of a piezoelectric ceramic and a stack of piezoelectric plates. Juvan teaches a sonic wave generator that comprises a piezoelectric device similar to that of the combination (see col. 17, lines 23-26 and col. 25, lines 14-17). It is further taught that the piezoelectric device is one of a piezoelectric ceramic and a stack of piezoelectric plates (see col. 24, lines 65-67 and col. 25, lines 42-56). It would have been obvious to one of ordinary skill in the art, having the teachings of the combination and Juvan before him at the time the invention was made, to modify the piezoelectric device taught by the combination to include the piezoelectric device that is one of a piezoelectric ceramic and a stack of piezoelectric plates of Juvan, in order to obtain an increase in operating efficiency, as taught by Juvan. One would have been motivated to make such a combination since Juvan has shown it to be notoriously known in the sonic wave generator art to use at least one of a piezoelectric ceramic and a stack of piezoelectric plates as the sonic wave device in order to increase operating efficiency and to extend the life of the system (see col. 17, lines 23-26 and col. 25, lines 14-17).

Regarding claims 25 and 31, the combination applied to claim 1 above similarly teaches the limitations of claims 25 and 31 as well as the further limitation of moving the back-off tool up and down the tubular member. It would have been obvious to one of ordinary skill in the art to move the back-off tool up and down depending on the size of the connection to be loosened,

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or if more than one connection needed to be loosened. In other words, if the connection to be loosened were larger than the back-off tool, then the tool would obviously need to be moved up and down to apply waves over the whole connection. Or, if more than one connection needed to be loosened, then the tool would be moved down to the first connection, and then moved up or down to the next connection to loosen it.

Regarding claims 35-38, the combination applied to claim 1 above teaches that the waves can be constant or variable (see col. 9, lines 20-74 of Bodine).

5. Claims 5, 7, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodine in view of Flanders et al and Juvan as similarly applied to claim 1 above, and further in view of US patent 5,351,754 to Hardin et al.

The combination applied to claim 1 above teaches an apparatus similar to the apparatus of claim 5 and a similar method to that of claim 43, with the simple exception of the controller not being taught as explicitly varying the amplitude and the frequency of the waves generated by the generator.

Hardin et al teach a sonic wave generator that is able to control both the amplitude and the frequency of the vibrations, or waves, generated by the generator (see col. 3, lines 5-25). It would have been obvious to one of ordinary skill in the art, having the teachings of the combination and Hardin et al before him at the time the invention was made, to modify the controller taught by the combination to include the ability to control both the amplitude and the frequency of the vibrations of Hardin et al, in order to obtain a controller that can control the vibrations with greater efficiency, accuracy, precision, and control. One would have first been motivated to make this modification to the combination's controller because the claims simply

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state that the controller only need be capable of, or configured for, controlling the frequency and the amplitude of the sonic waves. Both Bodine and Flanders et al teach that at least the frequency can be varied by a controller, and it would therefore be obvious to one of ordinary skill in the art that if a controller is capable of varying the frequency, then it would also be capable of varying the amplitude if such were known in the art. Hardin et al have shown that such is notoriously known in the sonic wave generator art. Although it is noted that the sonic waves are generated at the surface, Hardin et al are being used as simply a teaching reference to show that it is known, and non-novel, that controllers can vary both the frequency and the amplitude of the sonic waves. Additionally, Hardin et al teach that this wave control can be applied to widely diversified uses (see col. 3, lines 15-25).

Regarding claim 7, the combination applied to claim 5 above teaches that the sonic waves are configured to loosen the threaded connection (see col. 1, lines 15-18 of Bodine).

6. Claims 8-10, 16, 17, 21, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodine in view of Flanders et al and Juvan/Hardin et al as applied to claims 1 and 5 above, and further in view of US patent 6,012,521 to Zunkel et al.

Regarding claims 8-10, 16, and 42, the combination applied to claims 1 or 5 above teaches the method and apparatus for loosening a threaded connection using a sonic wave generator in a wellbore. It is not taught that there are two or more wave generators positioned at two or more locations, wherein the two or more generators are positioned so that a combination of the waves is greater than the plurality of waves from one generator, or that the two generators are configured to be activated simultaneously or at predefined times.

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Zunkel et al teaches a wave generator similar to that of the combination. It is further taught that there are more than two wave generators, the combined waves from the generators is substantially greater than the waves from one generator, and that the two generators are configured to be activated simultaneously and/or at predefined times (see col. 11, lines 35-54). It would have been obvious to one of ordinary skill in the art, having the teachings of the combination and Zunkel et al before him at the time the invention was made, to modify the method and apparatus taught by the combination to include the two or more wave generators of Zunkel et al. One would have been motivated to make such a combination since Zunkel et al have shown it to be notoriously known in the art that pressure (i.e., sonic) wave generators spaced apart in a work string will have an additive wave field intensity.

Regarding claim 17, the combination applied to claim 16 above teaches that the sonic waves are configured to loosen the threaded connection (see col. 1, lines 15-18 of Bodine).

Regarding claim 21, the combination applied to claim 16 above teaches that the method further comprises means for applying a reverse torque to the tubular (see col. 9, lines 9-19 of Bodine).

***Allowable Subject Matter***

7. Claims 24, 26, 28, 29, 32, 33, and 41 are allowed.
8. Claims 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



***Response to Arguments***

9. Applicant's arguments filed December 1, 2005 with respect to claims 1, 16, 25, and 31 have been fully considered but they are not persuasive. The Applicant states that Flanders teaches a system for freeing a stuck object in a wellbore, not for unscrewing pipe joints as the current invention does and Bodine does. While this in itself is true, it is not the intention of the combination to replace Bodine's whole invention with the system of Flanders. I am simply using Flanders as a teaching reference to show that the state of the art has progressed from the mechanical-type sonic wave generators of the 1960's to the concept of generators that use piezoelectrics so that the devices are lighter, require fewer parts, are less expensive, and are more practical. Had Bodine known of such a sonic wave generator at the time of his invention, one of ordinary skill could reasonably assume that the more practical and advantageous device would have been used.

The Applicant also states that Juvan is not a proper reference for combining with the above references. Again, I was simply using this reference as a teaching for piezoelectric ceramics in sonic wave generators since Flanders had already broadly taught the concept of piezoelectric generators. Therefore, it was not my intention to completely replace the system of the combination with the entire device of Juvan.

With regard to the arguments for claims 25 and 31, the Applicant appears to have relied upon the concept that Bodine's tool is subject to vibratory reciprocation, which is not substantial movement. While this may be true, it is not the reason I relied upon for rejecting these claims. Therefore, the rejection of these claims must still stand since the assertions I used in making said rejection have not been persuasively argued to the contrary.

With respect to claims 5 and 43, a new rejection has been used in view of the amendment to these claims, thus the arguments are moot.

10. Applicant's arguments, see pages 9 and 10, filed December 1, 2005, with respect to claims 22-24, 26, and 41 have been fully considered and are persuasive. The rejection of these claims and any dependents has been withdrawn.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shane Bomar whose telephone number is 571-272-7026. The examiner can normally be reached on Monday - Thursday from 6:30am to 4:00pm. The examiner can also be reached on alternate Fridays.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tsb  
February 17, 2006

~~David J. Bagnell~~  
~~Supervisory Patent Examiner~~  
~~Art Unit 3672~~

  
**Jennifer H. Gay**  
Primary Examiner